Remarks

Claims 1-23 were originally presented in the subject application. Claims 1-4, 6, 9, 11, 14, 17-19, 22 & 23 were amended, and claims 24-36 added in a Response dated August 20, 2003. No claims have herein been canceled, amended or added. Therefore, claims 1-36 remain in this case.

Applicants respectfully request entry of this Response, and reconsideration and withdrawal of the grounds of rejection and objection.

37 CFR 1.75(d)(1) Objection

The Examiner objected to the specification as failing to provide proper antecedent basis for claim language that includes "beginning portion of the recovered test data" (e.g., claim 1). Applicants respectfully submit that adequate support for this language is provided at, for example, p. 9, lines 6-24 and p. 11, lines 2-5 of applicants' specification. Initially, applicants note that these sections describe both the initial test data and the recovered test data as being "patterns." For instance, p. 9, lines 12-15 refer to "the initial test data generated by the pattern generator" and a comparison of that initial test data to "recovered data" rebuilt by a deserializer. This comparison is also described at p. 11, lines 2-5, which clarifies that the recovered data is also a pattern: "A second counter allows during a predefined period of time that numerous test patterns be repetitively generated as long as the **recovered test patterns** do not match the expected ones" (emphasis added). Further, these patterns are defined at p. 9, lines 16-18:

> The patterns are predefined to be made of a frame header signature followed by sequence of bits containing a maximum number of transitions such as '01010101...'.

Since a pattern in this context is composed of a frame header signature *followed by* a sequence of bits with maximum transitions, the frame header signature is clearly the beginning portion of the pattern. It then follows that the particular types of patterns, such as the recovered test data, also include a beginning portion, which is the frame header signature.

Based on the foregoing, applicants respectfully request reconsideration and withdrawal of the specification objection.

35 U.S.C. §102 Rejection

The Office Action rejected claims 24-28, 32-33 & 35 under 35 U.S.C. §102(e), as allegedly anticipated by Schneider (U.S. Patent No. 6,201,829 B1). Applicants respectfully, but most strenuously, traverse this rejection for the reasons below.

Claim 24 recites a built-in self test circuit for testing a clock and data recovery circuit. The circuit includes: (1) data generating means for generating a test data byte; (2) serializing means coupled to the data generating means for converting the test data byte into serial test data; (3) clock and data recovery means (CDR) coupled to the output of the serializing means for recovering the clock and test data from the serial test data; (4) deserializing means coupled to the output of the clock and data recovery means for converting the recovered serial test data into a recovered test data byte; and (5) analyzing means connected to the output of the deserializing means for comparing the recovered test data byte to the test data byte, wherein an outcome of the testing comprises indicating improper operation of the clock and data recovery means.

The final Office Action alleges at page 3 that applicants' claimed element of "wherein an outcome of the testing comprises indicating improper operation of the clock and data recovery means" is inherent in Schneider.

The doctrine of inherency is well-settled in patent law, and is best described in an excerpt from *Hansgirg v. Kemmer*, 26 C.C.P.A. 937, 102 F.2d 212, 40 U.S.P.Q. 665 (1939):

> Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient. [citations omitted.] If, however, the disclosure [of the cited reference] is sufficient to show that the natural result flowing from the operation as taught would result in the performance of the questioned function, it seems to be well settled that the disclosure should be regarded as sufficient [to anticipate the claimed invention].

Id. at 940, 102 F.2d at 214, 40 U.S.P.Q. at 667; *Stoller v. Ford Motor Co.*, 18 U.S.P.Q.2d 1545, 1547 (Fed. Cir. 1991); *Tyler Refrigeration v. Kysor Industrial Corporation*, 227 U.S.P.Q. 845, 847 (Fed. Cir. 1985); *Ex parte Levy*, 17 U.S.P.Q.2d 1461, 1464 (B.P.A.I. 1990); *In re Oelrich and Divigard*, 212 U.S.P.Q. 323, 326 (C.C.P.A. 1981).

In *Ex parte Levy*, the court stated that "[i]n relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic *necessarily* flows from the teachings of the applied prior art." *Ex parte Levy*, 17 U.S.P.Q.2d at 1464 (lengthy citation omitted) (underlining added).

The Office Action cites col. 9, lines 8-9 and col. 9, line 35 as supporting the alleged inherency. The first cited section states that the functionality of the transceiver is tested with regard to operation and speed. Applicants respectfully submit that the phrase "with regard to operation and speed" refers to testing done while the transceiver circuit is in operation and is operating at speed. This is more clearly asserted at col. 5, lines 63-67 of Schneider, which states that the signature analyzer returning a match signal indicates "that the transceiver circuit is able to serialize and deserialize 10 bit wide transmission character information at its nominal 1.06 GHz operational frequency" (see also col. 5, lines 15-18; col. 8, lines 64-67; col. 9, lines 12-16; col. 10, lines 57-60; and col. 11, lines 3-6). Thus, the signature analyzer's comparison does not describe or even suggest an improper operation of the CDR in particular. Instead, the analyzer in Schneider indicates the ability of the transceiver circuit to serialize and deserialize. If this indication suggests the operability of any particular components of the transceiver (and applicants are not at all convinced that it does), applicants submit that those components would be the serializer and/or deserializer, which are both different from the CDR (see FIG. 5 thereof, wherein serializer 52 and deserializer 58 are distinct from the phase lock loop 48).

Further, the second section cited in support of the alleged inherency merely states that all the clock inputs are tied to REFCLK (col. 9, line 35). REFCLK is a 106.25 MHz clock signal, which is a frequency equal to the operational speed of the input latch of the transceiver chip (col. 9, lines 35-38). This clock signal allows the linear feedback shift register (LFSR) to generate 10-bit test patterns that may be processed as though they were conventional transmission characters (col. 10, lines 11-13 & 34-46). Applicants respectfully submit that this section of Schneider addresses a specific frequency of a clock input that is an assumed condition of the test process. It does not discuss or suggest that an outcome of testing comprises indicating improper operation of the CDR.

For the reasons stated above, applicants respectfully submit that the Office Action does not provide a basis in fact and/or technical reasoning that reasonably supports a determination that the improper operation of the CDR necessarily flows from the teachings of Schneider. Thus, applicants submit that that the rejection fails to present a proper *prima facie* case of inherency, and independent claim 24 cannot be anticipated by Schneider.

35 U.S.C. §103 Rejection

The Office Action rejected claims 1-23, 29-31, 34 & 36 under 35 U.S.C. §103(a), as allegedly obvious over Schneider. Applicants respectfully, but most strenuously, traverse this rejection.

Claim 1 recites a technique for testing a clock and data recovery (CDR) circuit, which includes, for example, generating test data that comprises a frame header; converting the test data into serial test data; recovering the clock and test data from the serial test data; converting the recovered serial test data into recovered test data; and comparing a beginning portion of the recovered test data to the frame header. A match between the beginning portion of the recovered test data and the frame header indicates a positive outcome of the testing of the CDR circuit.

While the final Office Action admits that Schneider "fails to explicitly disclose [indicating] a successful testing based on whether there is a match between the beginning portion of the recovered test data and the frame header[,]" it is alleged therein that it would be obvious to do so in light of one skilled in the art knowing of the trade-off that exists in doing a "whole to whole comparison" and a comparison using only part of the data. Applicants submit that the allegation fails to present even a *prima facie* case, and that there must be some teaching, suggestion or incentive within the reference itself to make the leap alleged to be so obvious (see case law cited below).

Applicants submit the final Office Action lists in hindsight the modification utilizing a comparison with the beginning portion of the recovered test data. However, noticeably absent from the final Office Action is any express teaching, suggestion or incentive identified in the art itself for the proposed modification. It is well-settled that obviousness based on separate elements existing in multiple prior art references cannot be established absent some teaching or

suggestion, in the prior art, to combine the elements. A similar rationale applies to establishing obviousness based on a single reference. For example, *In re Kotzab*, 55 U.S.P.Q.2d 1313, 1316-17 (Fed. Cir. 2000) holds that:

> Even when obviousness is based on a single prior art reference, there must be a showing of a suggestion or motivation to modify the teachings of that reference.

The only justification given for the modification is the following language on page 5 of the final Office Action:

> However, it would have been obvious to a person of ordinary skill in the art at the time of the invention was made to implement the claimed invention because one of ordinary skill in the art know of the trade-off that exists in doing a "whole to whole comparison" and a comparison using just part of the data. One is more compact and leads sometimes to better results while the other is faster and may use less hardware.

This reasoning does not point to any particular discussion in Schneider and does not serve as the required showing of a suggestion or motivation to modify the teachings of Schneider as proposed by the final Office Action. Moreover, there is no support given for the allegation that one of ordinary skill in the art would know of the "trade-off." Applicants do not concede this point. If this rejection is maintained, applicants expressly request a showing of proof.

Even assuming, *arguendo*, that the final Office Action provided the requisite showing of a suggestion or motivation to modify Schneider, applicants submit that the proposed modification is improper, since Schneider's test pattern generation in accordance with the standard Fibre Channel 8B/10B transmission protocol teaches away from the proposed comparison using only a beginning portion of recovered test data. As valid transmission characters in the 8B/10B encoding scheme, the predefined test patterns in Schneider are transmitted as 10-bit patterns (i.e., 10-bit "transmission characters"; see col. 4, line 61 – col. 5, line 2). Further, no fewer than 10 bits in each pattern are necessary to provide inversion at the first and sixth bits, and to generate at least 255 unique patterns conforming to the 8B/10B protocol (col. 5, lines 19-50). Since the comparison of patterns in Schneider depends on their 10-bit based uniqueness, Schneider teaches away from the proposed modification that would use fewer than 10 bits (i.e., a beginning portion of the recovered test data).

For the reasons stated above, applicants submit that claim 1 cannot be rendered obvious over Schneider.

Claim 14 contains similar limitations to those argued above with respect to claim 1. Therefore, applicants submit that claim 14 also cannot be rendered obvious over Schneider.

CONCLUSION

Applicants submit that the dependent claims are allowable for the same reasons as the independent claims from which they directly or ultimately depend, as well as for their additional limitations.

For all the above reasons, applicants maintain that the claims of the subject application define patentable subject matter and earnestly request allowance of claims 1-36.

If a telephone conference would be of assistance in advancing prosecution of the subject application, applicants' undersigned attorney invites the Examiner to telephone him at the number provided.

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